DISTRICT 11

MATERIALS INFORMATION BROCHURE

MATERIALS ENGINEERING BRANCH

11-IMP-111
KP R20.9/R35.6
11-199361

CT CALIFORNIA DEPARTMENT OF TRANSPORTATION

State of California

Business, Transportation and Housing Agency

Memorandum

To : LEON EDMONDS
Office Engineer
District 11

Date: January, 2003

File: 11-IMP-111
KP R20.9/R35.6
EA 199361

From : **DEPARTMENT OF TRANSPORTATION - DISTRICT 11**
Materials Engineering Branch

Subject:: Materials Information Brochure

Attached herewith for your consideration

MATERIALS INFORMATION

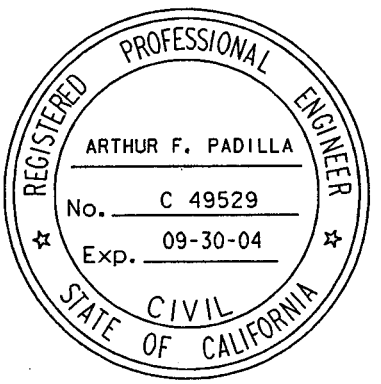
FOR PROPOSED PROJECT

IN IMPERIAL COUNTY

STATE ROUTE 111

In Imperial County in and near Brawley from 0.1 km south of Worthington Road to 0.1 north of Route 78

Arthur F. Padilla
District Materials Engineer



cc: W Valle (9)
D Ton (35)
S Sorourbakhsh (35)
L Edmonds (37)
J Egan (63)
Construction Admin. Senior (72)
Project File (mib 199361.doc)

MATERIALS INFORMATION

11-IMP-111
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NOTE: Information contained herein has been compiled in accordance with Section 2-1.03 of the Standard Specifications. Additional information is available for review at the District 11, Materials Laboratory, 7177 Opportunity Road, San Diego, California.

TABLE OF CONTENTS

INDEX OF SHEETS

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

PROJECT PLANS FOR CONSTRUCTION ON
STATE HIGHWAY

IN IMPERIAL COUNTY
IN AND NEAR BRAWLEY

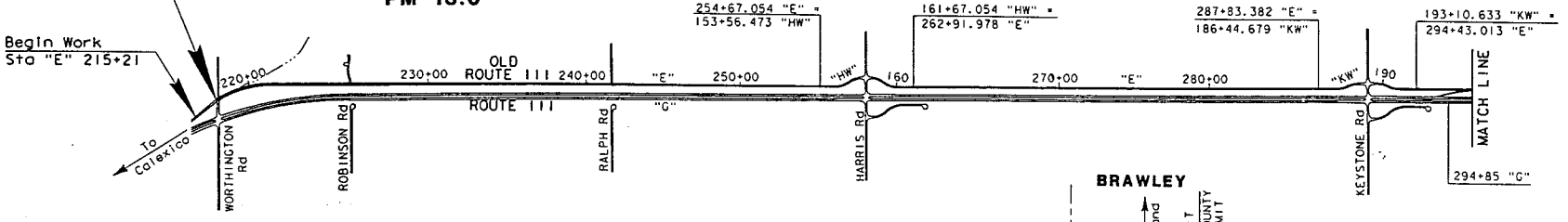
FROM 0.1 KM SOUTH OF WORTHINGTON ROAD
TO 0.4 KM NORTH OF ROUTE 78

To be supplemented by Standard Plans dated July, 1999

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
11	Imp	111	20.9/35.6	1	

IMPERIAL COUNTY

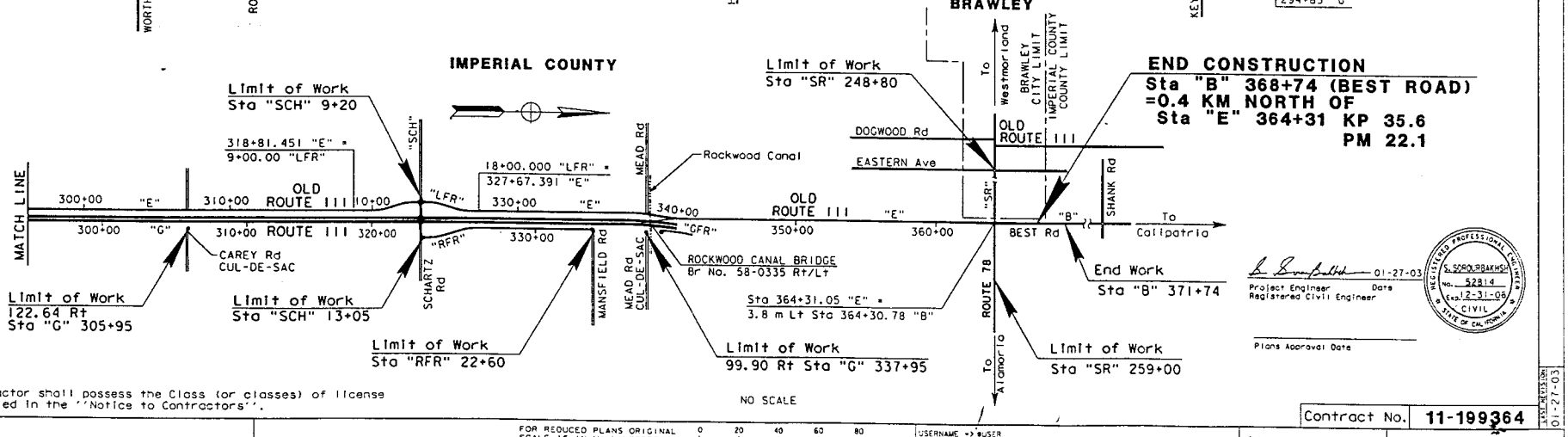
BEGIN CONSTRUCTION
Sta "E" 218+21 KP 20.9
PM 13.0



Caltrans Metric

BRAWLEY

IMPERIAL COUNTY



END CONSTRUCTION
Sta "B" 368+74 (BEST ROAD)
=0.4 KM NORTH OF
Sta "E" 364+31 KP 35.6
PM 22.1

NO SCALE

The Contractor shall possess the Class (or classes) of license as specified in the "Notice to Contractors".

S. SOROUBAKHSH 01-27-03
Project Engineer Date
Registered Civil Engineer

REGISTERED PROFESSIONAL ENGINEER
S. SOROUBAKHSH
No. 52814
Exp. 12-31-06
CIVIL
STATE OF CALIFORNIA

Plans Approval Date

PROJECT ENGINEER	DATE	DESIGN MANAGER	DATE
S. SOROUBAKHSH		D. TON	

LAST REVISION 01-27-03

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => $USER
DGN FILE => $REQUEST

Contract No.	11-199364
CU 11273	EA 199361

R-VALUES

R-values of the existing soils within the general limits of the project were found to vary from <5 to 49. See **Appendix A** for further detail.

BORING No.	STATION (meters)	OFFSET (meters)	DEPTH (meters)	R-Value
1	296+34	10 Rt.	0.0-1.5	<5
3	305+90	11 Rt.	0.0-1.5	49
5	313+94	17 Rt.	0.0-1.5	28
6	320+80	17 Rt.	0.0-1.5	<5
8	330+01	25 Rt.	0.0-1.5	16
11	341+80	8 Lt.	0.0-1.5	<5

Our recommended structural section designs are based on a minimum design R-value of 10. Traffic Indices were provided by the District 11 Traffic Department.

CORROSION ANALYSIS

Corrosion potential tests were performed on eleven near-surface soil samples and three water samples taken from irrigation return canals (drain ditches). Based on this testing, the environment is rated as generally corrosive to metal and reinforced concrete.

Please note that the farm field soil's sulfate and chloride content are lower than normal due to flooding and salt leaching practices. Once these practices cease, salts will accumulate to much higher levels through evapotranspiration. Therefore our culvert recommendations are based on a conservative design approach.

The design values chosen for input into Caltran's "Culvert 4.EXE" computer program to determine the 50-year design life recommendations are as follows:

1. pH = 7.7
2. Minimum Resistivity = 200 Ohms-cm
3. Sulfates = 4650 mg/kg
4. Chlorides = 2200 mg/kg
5. Non-abrasive flow conditions

RECOMMENDED CULVERT ALTERNATIVES

1. Plastic Pipe Culverts, either Polyethylene Pipe (Type S), Ribbed Profile Wall Polyethylene Pipe, Ribbed Profile Wall Polyvinyl Chloride Pipe that meet Caltran's current diameter and fill height requirements.

2. Type II Modified or Type V cement, 313.5 kg/m^3 cement, 104.5 kg/m^3 mineral admixture replacement (normally fly-ash), a maximum water-to-cementitious material ratio of 0.40, and a 70 mm minimum cover over all reinforcing steel.

GROUND WATER

Perched ground water was not encountered in any of the test pit excavations to the depth of 1.5 m (5 ft.). However, because of farm irrigation and possible canal leakage, water levels can be expected to vary depending on the season and on-site irrigation practices.

In the test borings performed by Geotechnical Roadway South, ground water was encountered from 0.8 to 3.3 m below the ground surface. In general, the existing ground water should have no significant impact on the project. However, in sections of the alignment where the ground water level may be less than 1.0 m, such as at station 302+70, 48 m left of the "G" centerline, special measures will be required to allow construction to proceed. These areas will require the installation of woven geotextile material and Class 2 base material. Such cases should be addressed during construction on a "when required" basis and not included in the Engineer's Estimate. Payment should be handled by CCO. For a detailed explanation of the installation, refer to the Geotechnical Design Report dated March 29, 2001.

GRADING FACTORS

The average relative compaction of existing soils within the upper 0.9 m (3 ft) is about 84 percent. Since these materials are relatively soft, it is anticipated that about 70 mm of settlement will occur due to compression of the existing soils during subgrade preparation, prior to placement of embankment soils. Based on mitigation measures recommended in the Materials Design Report dated October 31, 2001, we would anticipate a grading factor of 0.93 (7% shrinkage) for subgrade removal and recompaction.

EARTHWORK QUANTITIES

The following earthwork quantities are from the Engineer's Estimate:

Roadway Excavation	187,000 m^3
Imported Borrow	0 m^3
Class 2 Aggregate Base	42,000 m^3
Class 4 Aggregate Subbase	63,300 m^3

EMBANKMENT RECOMMENDATIONS

The following are recommendations for embankment material to be place above the existing ground and within the roadbed:

R-value 5

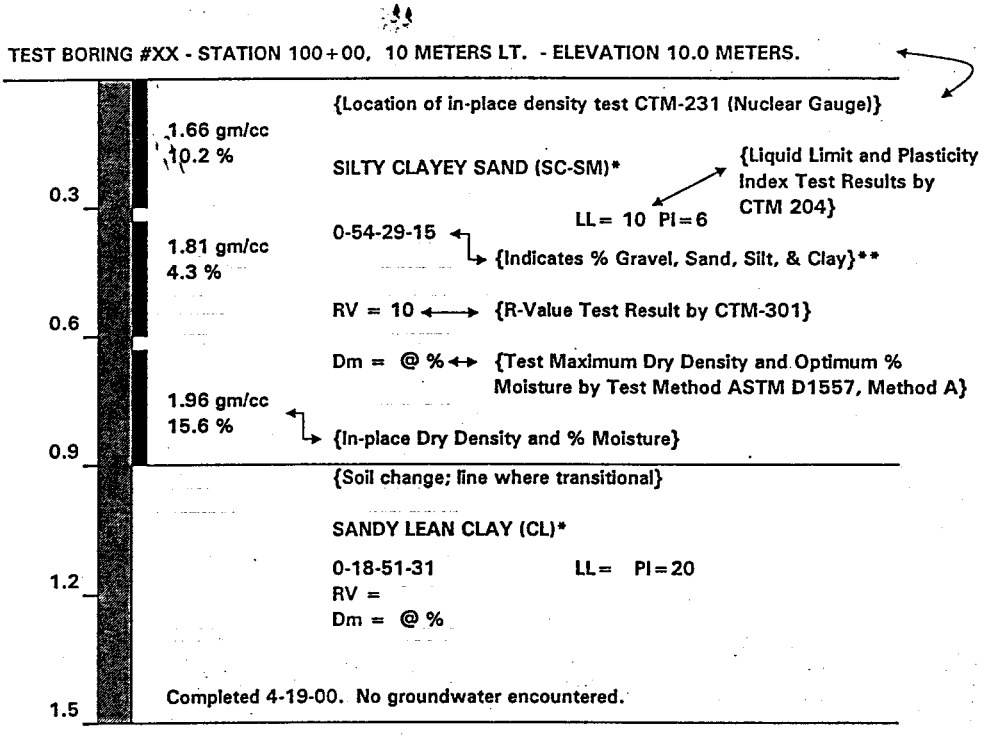
MATERIALS SOURCES

A current list (dated January 2003) of mining operations eligible to sell materials such as aggregates to the State of California in Imperial County follows:

Calif. Mine ID	Mine Name	Operated By
91-13-0001	PICACHO MINE	CHEMGOLD, INC.
91-13-0003	FRINK PIT	RYERSON
91-13-0004	SHOVELER ANNEX	U.S. GYPSUM COMPANY
91-13-0005	PLASTER CITY QUARRY	U.S. GYPSUM COMPANY
91-13-0006	OCOTILLO	CAL-GRADE, INC.
91-13-0009	SHELL CANYON	VAL-ROCK, INC.
91-13-0010	WONDERSTONE ROCK PIT	GRANITE CONSTRUCTION COMPANY
91-13-0011	NILAND PIT (FRINK)	GRANITE CONSTRUCTION COMPANY
91-13-0013	FLOWING WELLS	GRANITE CONSTRUCTION COMPANY
91-13-0015	NORRISH PIT	GRANITE CONSTRUCTION COMPANY
91-13-0017	MERRILL OCOTILLO - SHELL CANYON	GRANITE CONSTRUCTION COMPANY
91-13-0018	OCOTILLO (SCHAEFER)	GRANITE CONSTRUCTION COMPANY
91-13-0019	MESQUITE	NEWMONT GOLD COMPANY
91-13-0020	VISTA CHEROKEE RAINBOW (VCR)	NEWMONT MINING CORPORATION
91-13-0024	COACHELLA CANAL CLAY PIT	IMPERIAL COUNTY PUBLIC WORKS
91-13-0025	GLAMIS I	IMPERIAL COUNTY PUBLIC WORKS
91-13-0026	NILAND I	IMPERIAL COUNTY PUBLIC WORKS
91-13-0032	NAVY PIT HOGUE	IMPERIAL COUNTY PUBLIC WORKS
91-13-0033	COYOTE II	IMPERIAL COUNTY PUBLIC WORKS
91-13-0034	PAINTED GORGE	IMPERIAL COUNTY PUBLIC WORKS
91-13-0038	STANDARD	IMPERIAL COUNTY PUBLIC WORKS
91-13-0039	PICACHO WASH PIT	IMPERIAL COUNTY PUBLIC WORKS
91-13-0040	ANDRE ROAD CLAY PIT	IMPERIAL COUNTY PUBLIC WORKS
91-13-0042	NILAND II	IMPERIAL COUNTY PUBLIC WORKS
91-13-0043	FRINK	IMPERIAL COUNTY PUBLIC WORKS
91-13-0046	COYOTE	CALTRANS
91-13-0049	NEW RIVER FINES	BECKER MEALEY LLC
91-13-0052	OCOTILLO	CALTRANS
91-13-0057	WRIGHT PIT	AGGREGATE PRODUCTS, INC.
91-13-0059	CITY OF EL CENTRO M.S.	CITY OF EL CENTRO
91-13-0061	JACKSON GULCH	ORLOSKY, INC.
91-13-0062	AMERICAN GIRL CANYON	AMERICAN GIRL MINING JV
91-13-0063	DROP 3 CLAY PIT	IMPERIAL IRRIGATION DISTRICT
91-13-0064	MOUNT SIGNAL GRAVEL PIT	IMPERIAL IRRIGATION DISTRICT
91-13-0066	PADRE MADRE	AMERICAN GIRL MINING JOINT VENTURE
91-13-0069	ROBERT'S PIT	RYERSON
91-13-0071	FRINK SPRINGS GRAVEL PIT	CAL-GRADE, INC.
91-13-0072	GIBSON & SCHAEFER	GIBSON & SCHAEFER, INC.
91-13-0074	FLOWING WELLS SOUTH PIT	GRANITE CONSTRUCTION CO
91-13-0075	DIXIELAND RANCH MINE	BECKER MEALEY LLC
91-13-0076	HENSLER PIT	GRANITE CONSTRUCTION COMPANY
91-13-0079	TORRES-MARTINEZ PIT	IMPERIAL COUNTY
91-13-0080	ELMS GLAMIS PIT	ELMS EQUIPMENT RENTAL, INC.
91-13-0086	HOLTVILLE CLAY PIT	IMPERIAL COUNTY
91-13-0091	SHANK ROAD EAST HIGHLINE PIT	ALL AMERICAN AGGREGATES
91-13-0093	WRIGHT PIT II	AGGREGATE PRODUCTS, INC.
91-13-0095	AMMEX PIT	GRANITE CONSTRUCTION CO.
91-13-0098	JIMENEZ PIT	GRANITE CONSTRUCTION CO.
91-13-0102	EAST MESA PIT	BECKER MEALEY LLC
91-13-0103	TAECKER PIT	DENNISN DILL TRUCKING
91-13-0106	FRINK MINERAL PIT	CAL-GRADE, INC.
91-13-0107	WILSON'S CORNER SITE	AGGREGATE PRODUCTS, INC.
91-13-0108	API-HIGHLINE PIT	AGGREGATE PRODUCTS, INC.
91-13-0109	MCFARLAND'S SITE	AGGREGATE PRODUCTS, INC.

APPENDIX A

TEST BORING LEGEND

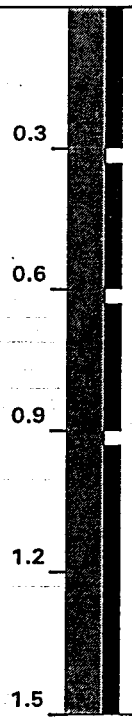


* Estimated unified Soil Classification

** Gravel: 76.2 mm to 4.75 mm
Sand: 4.75 mm to 75 microns
Silt: 75 to 5 microns
Clay: less than 5 microns

Test Methods CTM 202 &203

TEST BORING #1 - STATION 296+34, 10 METERS RT. - ELEVATION 57.5 METERS.



Material too soft to test

0.3

1.49 gm/cc
24.5 %

FAT CLAY(CH)

0.6

0-2-30-68 LL=65 PI=47
RV = <5
Dm = 1.77 gm/cc @ 17.8%

1.51 gm/cc
25.6 %

0.9

1.2

1.5

Completed 1-23-01. No groundwater encountered.

TEST BORING #2 - STATION 299+04, 58 METERS LT. - ELEVATION 57.3 METERS.

1.68 gm/cc
15.9 %

0.3

1.52 gm/cc
21.6 %

FAT CLAY (CH)*

0.6

0-3-30-67 LL=65 PI=47
RV = <5
Dm = 1.77 gm/cc @ 17.8%

1.55 gm/cc
23.6 %

0.9

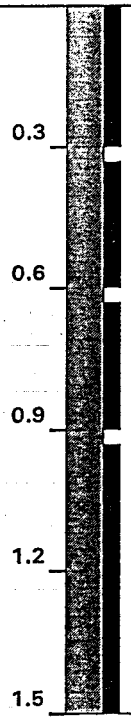
1.2

1.5

Completed 1-23-01. No groundwater encountered.

* Estimated Unified Soil Classification

TEST BORING #3 - STATION 305+90, 11 METERS RT. - ELEVATION 59.4 METERS.



1.49 gm/cc
5.4 %

LEAN CLAY WITH SAND (CL)

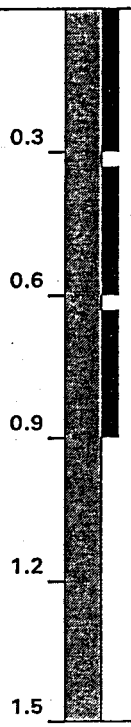
1.44 gm/cc
8.6 %

0-22-53-25 LL=28 PI=9
RV = 49
Dm = 1.88 gm/cc @ 14.3%

1.41 gm/cc
11.8 %

Completed 1-23-01. No groundwater encountered.

TEST BORING #4 - STATION 311+14, 55 METERS LT. - ELEVATION 60.8 METERS.



1.68 gm/cc
12.5 %

FAT CLAY (CH)*

1.64 gm/cc
17.7 %

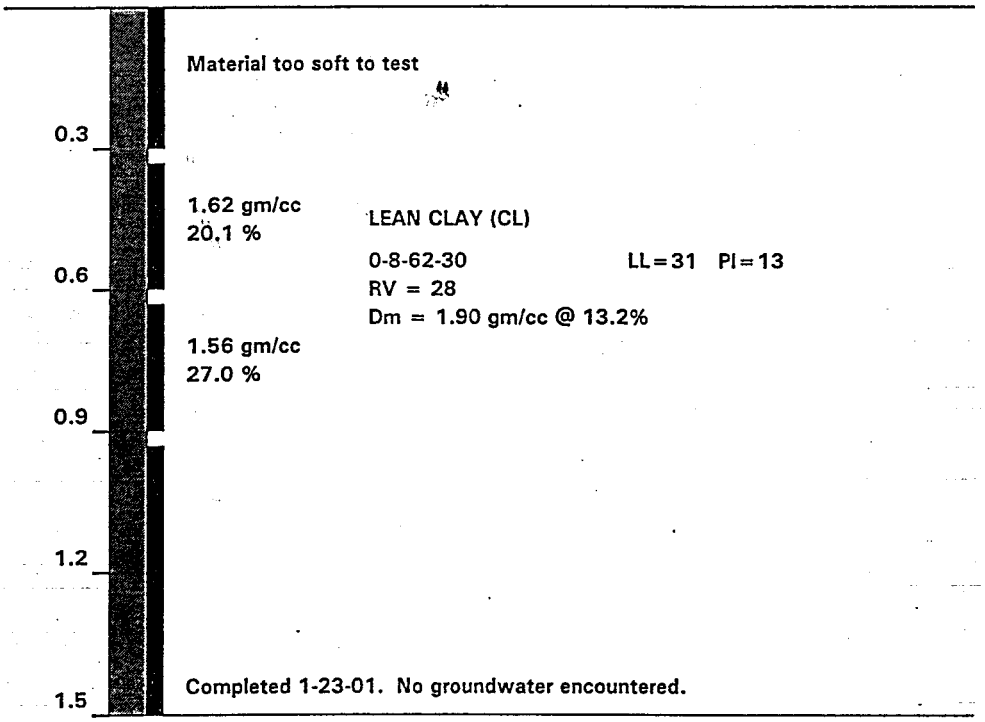
5-15-28-52 LL=58 PI=39
RV = <5
Dm = 1.88 gm/cc @ 14.2%

1.56 gm/cc
25.7 %

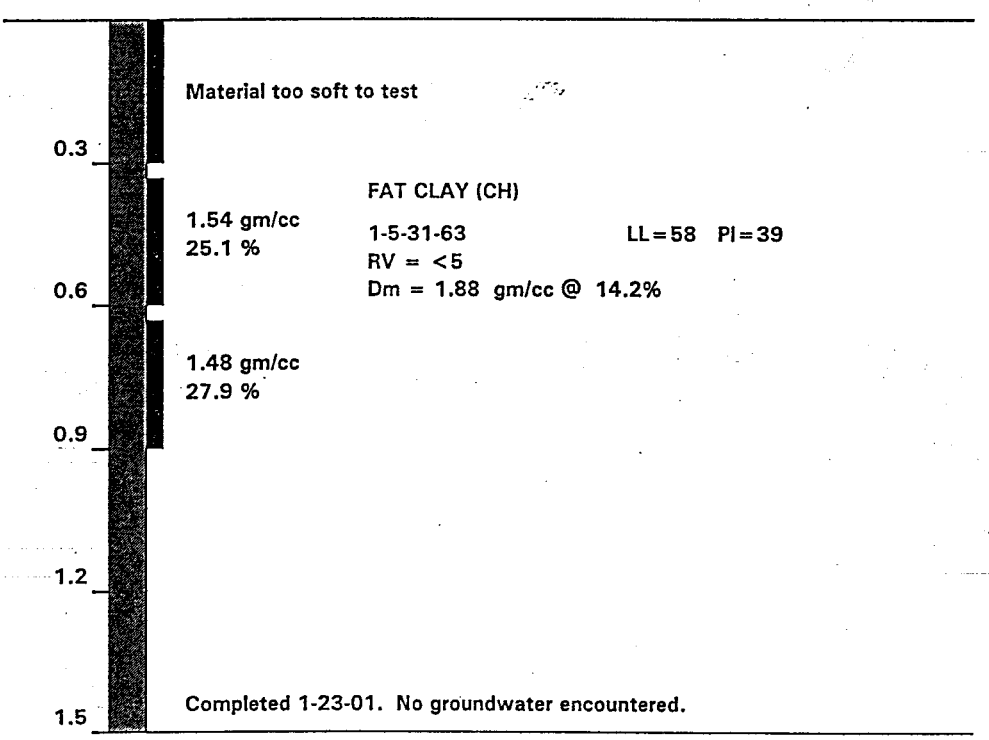
Completed 1-23-01. No groundwater encountered.

* Estimated Unified Soil Classification

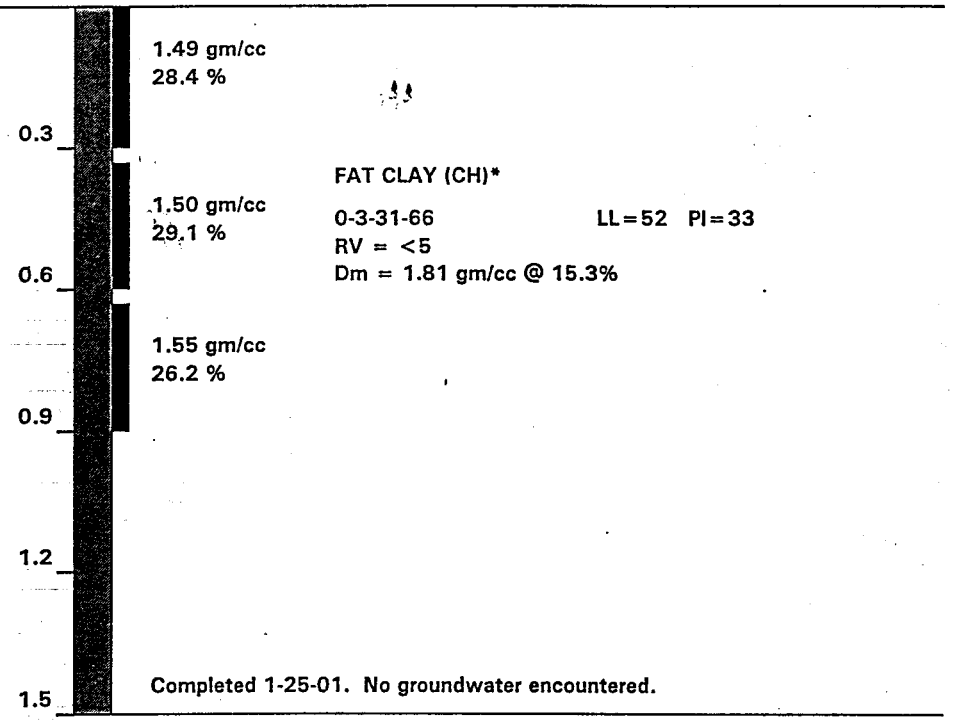
TEST BORING #5 - STATION 313+94, 17 METERS RT. - ELEVATION 63.9 METERS.



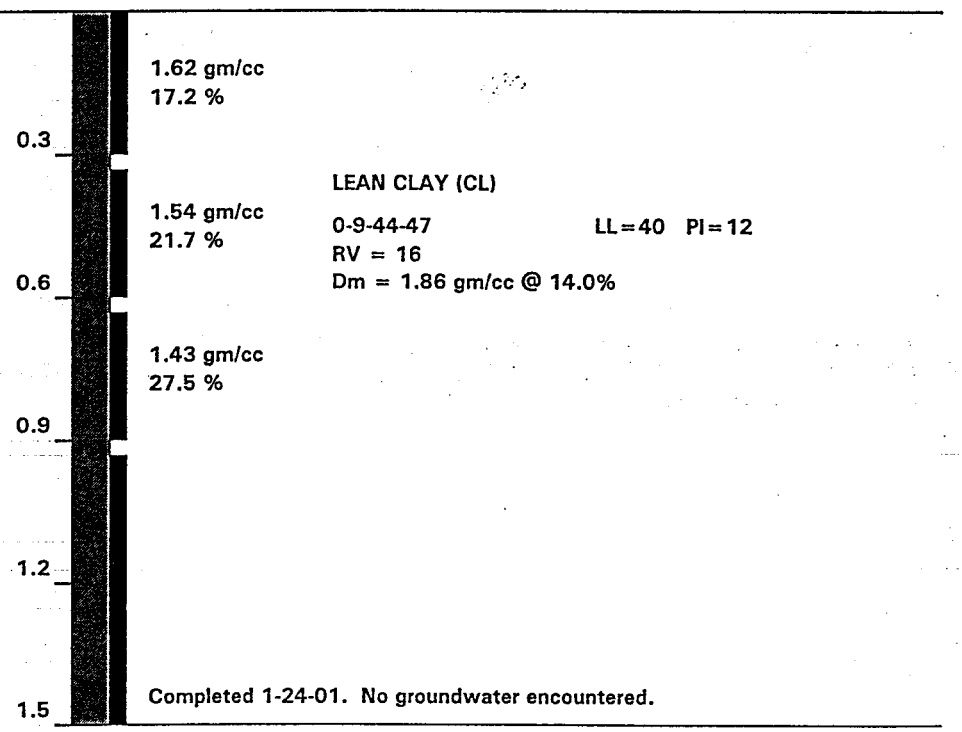
TEST BORING #6 - STATION 320+80, 17 METERS RT. - ELEVATION 61.7 METERS.



TEST BORING #7 - STATION 324+72, 52 METERS LT. - ELEVATION 61.6 METERS.

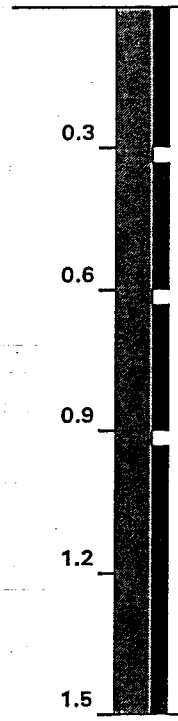


TEST BORING #8 - STATION 330+01, 25 METERS RT. - ELEVATION 62.8 METERS.



* Estimated Unified Soil Classification

TEST BORING #9 - STATION 333+52, 42 METERS LT. - ELEVATION 63.0 METERS.



Material too soft to test

1.56 gm/cc
17.6 %

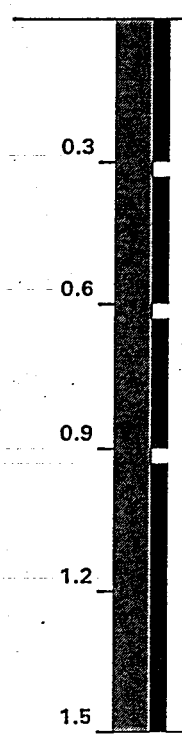
FAT CLAY(CH)*

0-4-34-62 LL=65 PI=47
RV = <5
Dm = 1.77 gm/cc @ 17.8%

1.49 gm/cc
23.1 %

Completed 1-24-01. No groundwater encountered.

TEST BORING #10 - STATION 338+41, 36 METERS LT. - ELEVATION 63.4 METERS.



1.52 gm/cc
11.9 %

1.53 gm/cc
18.6 %

FAT CLAY (CH)*

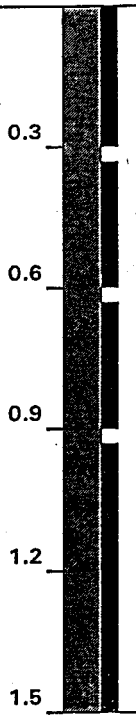
0-2-37-61 LL=52 PI=33
RV = <5
Dm = 1.81 gm/cc @ 15.3%

1.47 gm/cc
23.1 %

Completed 1-24-01. No groundwater encountered.

* Estimated Unified Soil Classification

TEST BORING #11 - STATION 341+80, 8 METERS LT. - ELEVATION 64.3 METERS.



1.52 gm/cc
20.0 %

1.57 gm/cc
20.1 %

FAT CLAY (CH)

0-2-42-56 LL=52 PI=33
RV = <5
Dm = 1.81 gm/cc @ 15.3%

1.46 gm/cc
26.4 %

Completed 1-24-01. No groundwater encountered.